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AMBIENT AIR QUALITY
POST-OPERATIONAL SURVEY PART 1:
ENERGY-FROM-WASTE PLANT
VICTORIA HOSPITAL CORPORATION
LONDON, ONTARIO

JANUARY 1989

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Jim Bradley
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AMBIENT AIR QUALITY
POST-OPERATIONAL SURVEY PART 1:
ENERGY-FROM-WASTE PLANT
VICTORIA HOSPITAL CORPORATION
LONDON, ONTARIO

R. Chapman
Air Resources Branch
Southwestern Region

JANUARY 1989
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RECYCLABLE

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Executive Summary

A mobile air monitoring unit (MAMU) from the Air Resources Branch measured ambient air quality parameters near the Victoria Hospital Corporation Energy-From-Waste (EFW) plant in London during late June 1988. This was the first part of the post-operational survey to determine the ambient air concentrations of a large number of compounds which may be emitted from the EFW plant in various concentrations. The EFW plant was operated at 80% to 100% of capacity during the survey.

The effect of the EFW incinerator emissions on the ambient air quality during this survey was not significant or noticeable. That assessment is based on several factors. The one-hour average ambient air concentrations of the common contaminants such as CO and NO were very similar to the pre-operational survey results. The wind and pollution rose plots for CO, NO and THC did not point to the EFW stack as a source of CO, NO or THC emissions during the survey period. The ambient air concentrations of 132 organic compounds as determined by gas chromatography showed that none of the Ministry's air quality criteria was exceeded or approached, and generally agreed with the results of the two pre-operational surveys. There was no visible plume and no odours were perceived at any time by the monitoring crew.

1.0 Introduction

At the request of the Southwestern Region, the Monitoring and Instrumentation Development Unit of the Air Resources Branch performed an ambient air quality survey in London during the period June 21 to June 24, 1988. The air sampling was done near the site of the Victoria Hospital Corporation Energy-From-Waste (EFW) plant, and was the first part of the post-operational sampling as required by an agreement between the Victoria Hospital Corporation and the Ministry of the Environment. Parts I and II of the pre-operational survey were done in 1984 and 1986.

The purpose of the survey was to determine the ambient air concentrations of a large number of compounds which may be emitted from the EFW plant stack in various concentrations, namely: sulphur dioxide (SO2), carbon monoxide (CO), nitrogen dioxide (NO2), and a large number of hydrocarbons and chlorinated hydrocarbons. Most of the sampling periods coincided with a stack sampling and analysis program for particulate and hydrochloric acid (HCl) as performed by an environmental consulting company under contract. The present ambient air survey was done while the EFW plant was operating at 80-100 % of full capacity, and the results will be used to assess its impact, if any, on the ambient air quality. A general description of the EFW plant process is given in Appendix D, and a summary of the EFW plant operating conditions during the survey is given in Appendix E.

A mobile air monitoring unit (MAMU#1) from the Air Resources Branch was used for the ambient air survey.

2.0 The Mobile Air Monitoring Unit (MAMU)

The MAMU#1 is a self-contained mobile laboratory equipped with advanced analytical instrumentation dedicated to ambient air monitoring. The instrumentation package is listed in Table 1. A gas chromatograph (Hewlett-Packard 5880) coupled to a volatile organic compounds (VOC's) preconcentrator of the Ministry's design is used to measure up to 132 compounds in each one-hour sample. Ambient air is drawn into the preconcentrator at 100 ml/min where the VOC's are adsorbed onto a 10 mm O.D. glass cartridge packed with the adsorbents Carbotrap and Spherocarb.

The sampling periods were 60 minutes for the gas chromatograph samples so that the data could be directly compared to Ministry criteria for ambient air and to the results of the pre-operational surveys. Contaminants trapped by the adsorbents were thermally desorbed, prefocused, and injected onto the gas chromatograph column head. The samples were analyzed simultaneously on two 25-metre columns coated with SE-54 or OV-1 and detected with flame ionization detectors. Method detection limits were estimated to be in the range of 1 to 10 micrograms per cubic metre (ug/m3) of ambient air.

The current status of the organics sampling system is as follows:

- Compound identification is based on a gas chromatograph (GC) with a dual-column retention time index (RI) system. The RI of each compound peak detected by the GC is compared to a list (library) of known RIs for a large number of compounds. Retention time of a compound can shift enough daily to make identification impossible, so the retention times are verified each day (and updated if necessary) by analyzing a sample from a standard mixture of straight chain alkanes (C_3 - C_{12}). The probability of correctly identifying a compound based only on its RI is approximately 80%-90% for a dual-column system where the RI is within specified limits on both columns. If more than one library compound has an RI within the specified limits of RI on either column (interference), the correct identification and quantity of the unknown compound become less certain.

Concentrations less than 1 ug/m^3 are reported as N.D. (not detected), concentrations between 1 ug/m^3 and 5 ug/m^3 are reported as D (detected), and concentrations above 5 ug/m^3 are reported as actually determined. Results appended with a (i) denote interference presence and are less certain in identification and concentration than the other results.

3.0 Monitoring Locations

The selection of monitoring locations was based upon the locations used in the pre-operational surveys. As determined by the wind direction on an hourly basis, the MAMU was positioned downwind of the EFW stack in whatever previous location was suitable; otherwise, school yards, apartment building parking lots, and open areas on residential streets were the usual monitoring sites. Most of the locations were identical to sites used in the pre-operational surveys. The precise monitoring locations are listed in Table 2 and displayed on the map in Figure 3.1.

4.0 Results and Discussion

4.1 Common Contaminants

A summary of the results is contained in Table 3. Standards, Criteria and other notable parameters of the common contaminants measured by MAMU #1 are listed in Table 4. Sulphur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), nitric oxide (NO) and total hydrocarbons (THC) were found in relatively low concentrations during all monitoring periods. The complete data set for these compounds is in Appendix A. None of the applicable Ministry of Environment air quality criteria was exceeded or approached.

In comparison with the results for the pre-operational surveys, whose summary tables are shown in Appendix C, the maximum 1-hour average concentrations of the common contaminants (Table 3) was very similar. There was no indication of a change in concentrations due to the operation of the EFW incinerator. There was no visible plume and no odours were perceived at any time by the monitoring crew.

A detailed analysis of the CO, NO and THC data was performed with respect to wind direction for each of the monitoring periods. The results were plotted as wind roses and pollution roses that summarized the wind direction and pollutant concentration on a minute-by-minute basis. An example is shown in Figure 4.1. The EFW location is shown (relative to the MAMU location) for each rose; the pollution rose arrow lengths correspond to the CO concentration when the wind was blowing from each of those directions. There was no indication from any of the pollution roses that the EFW incinerator was a significant source of CO, NO or THC emissions during the survey period.

4.2 Volatile Organic Compounds (Gas Chromatograph)

A rough indication of the result for each sample is given by the total organic compounds (TOC) concentration in Table 3. A comparison of the TOC results with the results for the pre-operational surveys (Appendix C) revealed no significant difference. As a group the present results lie between the two pre-operational surveys. The complete set of gas chromatographic results for 132 organic compounds in all samples is contained in Appendix B. A review of the complete organic results revealed no significant concentrations at any time for any of the 132 compounds; that is, none of the Ministry's air quality criteria was exceeded or approached. Table 5 lists the Ministry's criteria for 1-hour samples where applicable.

5.0 Conclusions

The effect of the EFW incinerator emissions on the ambient air quality during this survey was not significant or noticeable.That assessment is based on several factors. The one-hour average ambient air concentrations of the common contaminants such as CO and NO were very similar to the pre-operational survey results. The wind and pollution rose plots for CO, NO and THC did not point to the EFW stack as a source of CO, NO or THC emissions during the survey period. The ambient air concentrations of 132 organic compounds as determined by gas chromatography showed that none of the Ministry's air quality criteria was exceeded or approached, and generally agreed with the results of the two pre-operational surveys. There was no visible plume and no odours were perceived at any time by the monitoring crew.

6.0 References

1. Ambient Air Quality Pre-Operational Survey, Part I
   Report Number ARB-082-85-AQM (1985)

2. Ambient Air Quality Pre-Operational Survey, Part II
   Report Number ARB-126-87-AQM (1988)

Table 1

THE INSTRUMENTATION OF MOBILE AIR MONITORING UNIT #1

Instrument	Manufacturer	Analytical Technique	Full Scale Sensitivity
THC, CH4, TH-M analyzer	Ingenieur-Produktions-Gruppe Munchen (IPM) RS-t	Dual flame ionization	50 ppm THC (as CH4)
H2S, SO2, NOx sources	Hartmann & Braun Prufgasgenerator	N/A	N/A
TRS/SO2 analyzer	Monitor Labs 8850 c/w ML 8770	Fluorescence	0.5 ppm SO2 0.5 ppm TRS
NOx, NO2, NO analyzer	Monitor Labs 8840	Chemi-Luminescence	1.0 ppm NOx (as NO2)
CO analyzer	Thermo Electron P48	Gas Filter Correlation	100 ppm CO (digital)
O3 analyzer/ source	Dasibi 1003-AAS	UV Absorption	1.0 ppm O3 (digital)
Hewlett Packard Data Acquisition System - HP 85 and HP 3497A			
Gas Chromatograph	HP 5880 Dual Capillary Column c/w HP 86 Data Acquisition System	Flame Ionization Det.	as set per calibrations

Meteorological Instrumentation

Instrument	Manufacturer	Scale
** Wind speed	Lambrecht GmBH	km/hr
** Wind direction	Lambrecht GmBH	degrees
Temperature	Weather Measure (WM) T621	degrees Celsius
Humidity	WM-HM-11P	absolute & %
Barometric pressure	WM-BM70-B242	millibars
Solar Radiation	WM Star Pyranometer	milliwatts/cm2

** These instruments are located on top of a 10 metre retractable tower

TABLE # 2

Monitoring Locations and Periods

Date	Period #	Start Time	Duration (hrs)	Location	Map I.D. (fig. 3.1)
88/06/21	A212	13:06	4.03	Bristol Apts. parking lot	A
/22	A222	8:26	1.07	Arlington Cr./Renfro Cr.	B
/22	A223	10:13	0.68	Glencairn Public School	C
/22	A224	12:01	2.90	Parliment Cr. (#53)	D
/23	A232	9:03	1.17	Tourism Information parking lot	E
/23	A233	10:59	3.53	Ebury Cr. (by #97)	F
/23	A234	14:53	3.47	Arthur Stringer Public School	G
/23	A235	18:59	1.18	Victoria Hospital Parking Lot	H
/24	A242	9:55	1.42	Whetter Ave. (by #751)	J
/24	A243	12:35	1.13	200m S.W. of Stack	K
/24	A244	14:07	2.70	Herkimer St. (#247)	L

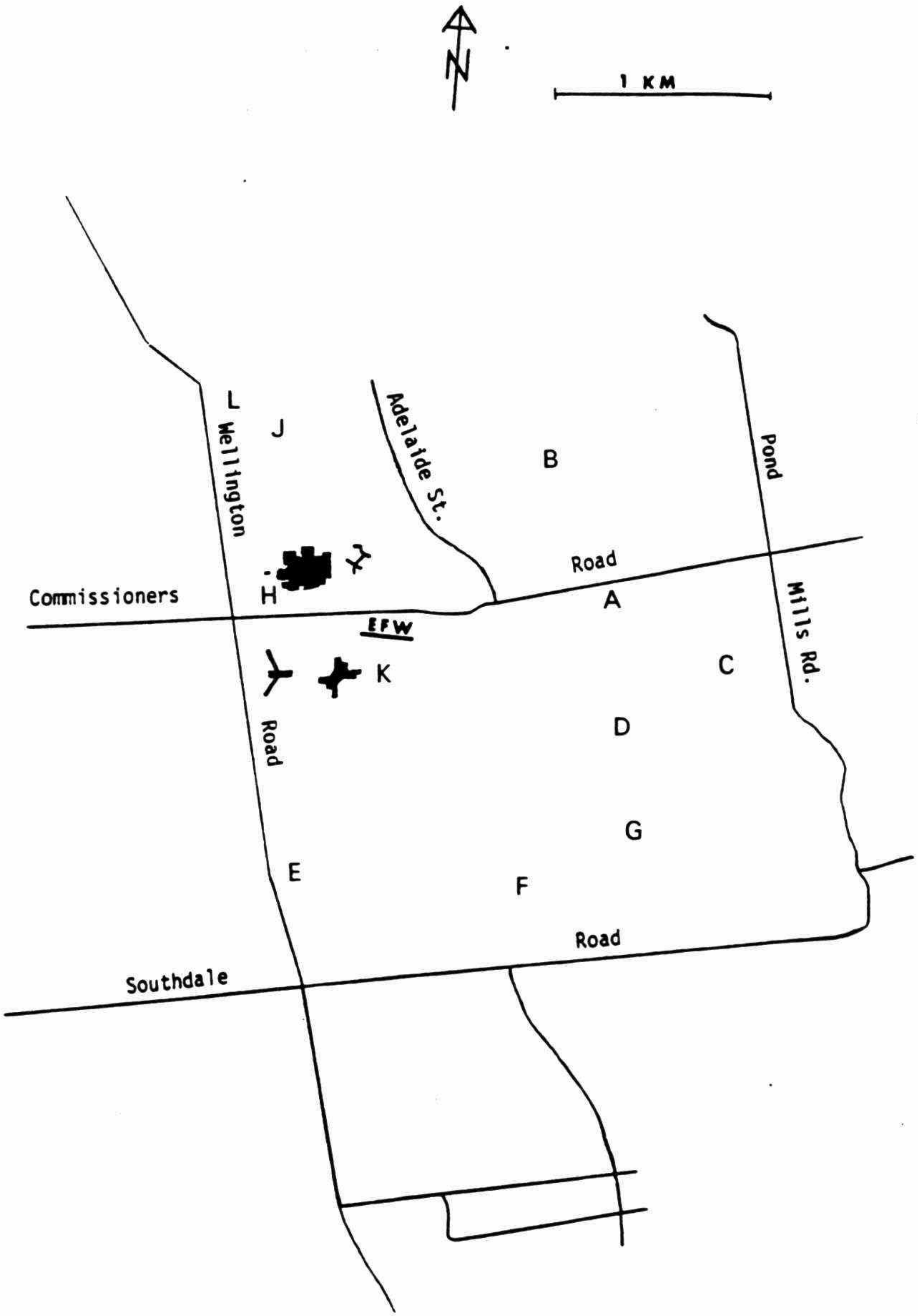


Figure 3.1 Monitoring Locations in Table 2

TABLE 3

London_88: Results Summary

Maximum 1-hr Average Concentration
(ppm, except as noted)

Monitoring Period No.	SO_2	CO	NO_2	NO	THC	TOC** (ug/m^3)	upwind/ downwind
A212*	ND	1.01	0.02	0.01	-	81, 57	DW
A222	ND	0.62	0.03	0.01	2.8	169	DW
A223	N.A.	N.A.	N.A.	N.A.	N.A.	111 (1/2 hr)	DW
A224	ND	1.13	0.01	0.02	2.7	47,82	DW
A232	ND	0.27	0.01	0.01	1.9	83	DW
A233	ND	0.81	0.01	0.03	2.5	117,175	DW#
A234	ND	0.54	0.01	0.01	2.2	70,32	DW
A235	ND	0.54	0.01	0.01	2.0	56	UW
A242	ND	1.02	0.02	0.03	2.4	110	DW#
A243	ND	0.80	0.01	0.01	2.9	112	UW#
A244	ND	1.33	0.02	0.03	3.7	190	DW#
Min. Det Level	0.01	0.1	0.01	0.01	0.1		

*	A refers to MAMU #1
**	This list contains all of the TOC results from the gas chromatograph
-	Not monitored
N.A.	Not available (less than 1 hr.)
ND	Not detected (measured concentration below Instruments' detection limit)
#	Some exhaust from MAMU

Table 4.

Characteristics of the Common Contaminants as Measured Continuously by MAMU #1

All concentrations are in terms of ppm (parts per million)

	Standards, Guidelines or Provisional Guidelines (0.5 hr.)		Criterion (1-hr.)	TWA	STEL			Alternate Names
1 SULPHUR DIOXIDE	0.300		0.25	2	5		SO2	SULFUR DIOXIDE
2 TOTAL REDUCED SULPHUR	0.027	*	0.027	10	15	**	TRS	
3 NITROGEN OXIDES	0.25	***	N/A	-	-		NOx	OXIDES of NITROGEN
4 NITROGEN DIOXIDE	N/A		0.20	5	5		NO2	
5 NITRIC OXIDE	N/A		N/A	25	35		NO	NITROGEN MONOXIDE
6 OZONE	0.1		0.08	0.1	0.3		O3	
7 CARBON MONOXIDE	5.0		30.0	50	400		CO	

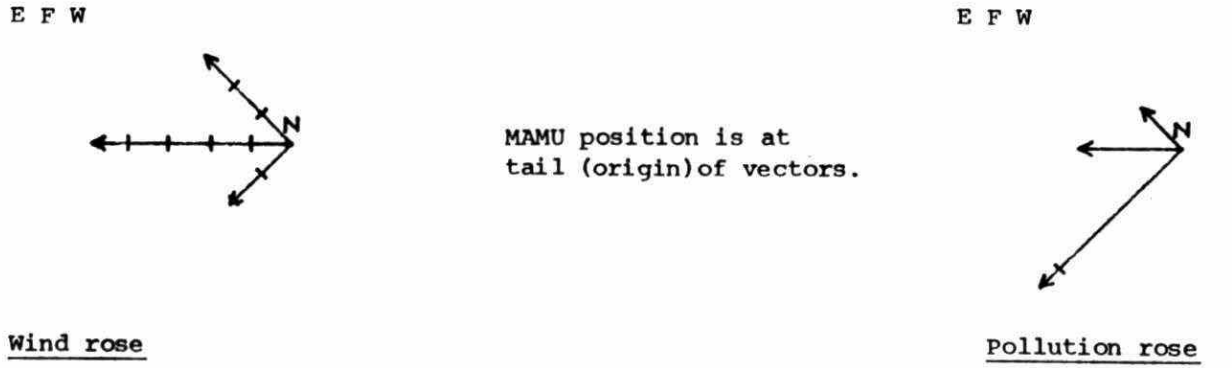
* As equivalent H2S and applicable only for Kraft Pulp Mills
TRS may contain any of the following: Hydrogen Sulphide (H2S), Methyl Mercaptan (CH3SH), Dimethyl Sulphide (C2H6S) and Dimethyl Disulphide (C2H6S2).
** The TWA and STEL for TRS is expressed solely for Hydrogen Sulphide concentrations
*** Expressed as NO2
N/A Not Applicable

LONDON_88: A224

Start: 88/06/22 12:00 Scan: 60 sec. Ave: 1.0 min. Duration: 2.9 hrs.
Loc: PARLIAMENT CR. (#53) D.W.

WINDS Blowing From
1 Division = 10% of Time
Calm (< 3 km/hr) = .0%
Low (< 3 km/hr) = .0%
High (>100 km/hr) = .0%

CO Blowing From
1 Division = 1 ppm — A. MEAN



MAMU position is at
tail (origin) of vectors.

Wind rose

Pollution rose

Figure 4.1 Wind rose and CO pollution rose for period A224.

Table 5

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

	Standards, Guidelines or Provisional Guidelines	Criterion	TWA	STEL	Alternate Names
1 PROPANE					
2 PROPADIENE					ALLENE
3 PROPYNE					METHYL ACETYLENE
4 CYCLOPROPANE					
5 2-METHYLPROPANE					ISOBUTANE
6 CHLOROETHENE	560 (2)	280 (A)	5000	10000	VINYL CHLORIDE; CHLOROETHYLENE
7 1-BUTENE					
8 1,3-BUTADIENE					
9 BUTANE			1900000		*n-BUTANE*
10 1-BUTYNE					ETHYLACETYLENE
11 CHLOROETHANE			2600000	3250000	ETHYL CHLORIDE
12 3-METHYL-1-BUTENE					ISOAMYLENE
13 2-METHYLBUTANE					ISOPENTANE
14 2-METHYL-1-BUTENE					
15 PENTANE			1800000	2250000	*N-PENTANE*
16 2-METHYL-1,3-BUTADIENE					ISOPRENE
17 trans-2-PENTENE					
18 cis-2-PENTENE					
19 DICHLOROMETHANE	100000 (1)	100000 (A)	350000	1740000	METHYLENE CHLORIDE
20 2-METHYL-2-BUTENE					

Table 5 ctd.

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

	Standards, Guidelines or Provisional Guidelines	Criterion	TWA	STEL	Alternate Names
21 2,2-DIMETHYLBUTANE					NEOHEXANE
22 trans-1,2-DICHLOROETHENE					
23 3-METHYL-1-PENTENE					
24 4-METHYL-1-PENTENE					
25 CYCLOPENTANE					
26 2,3-DIMETHYLBUTANE					
27 2-METHYLPENTANE					
28 3-METHYLPENTANE					
29 1-HEXENE					
30 cis-1,2-DICHLOROETHENE			790000	1000000	cis-1,2-DICHLOROETHYLENE; SYM-DICHLOROETHYLENE
31 2-CHLOROBUTANE					sec-BUTYL CHLORIDE
32 1-CHLORO-2-METHYLPROPANE					
33 HEXANE	35000 (2)	12000 (A)	180000		*n-HEXANE*
34 CHLOROFORM	1500 (2)	500 (A)	50000	225000	TRICHLOROMETHANE
35 3-CHLORO-2-METHYLPROPENE					ISOBUTENYL CHLORIDE
36 METHYLCYCLOPENTANE					
37 2,4-DIMETHYLPENTANE					
38 1,2-DICHLOROETHANE			40000	60000	ETHYLENE CHLORIDE
39 2,2-DIMETHYLPENTANE					
40 1,1,1-TRICHLOROETHANE	350000 (1)	115000 (A)	19000000	2450000	METHYL CHLOROFORM

Table 5 ctd.

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

	Standards, Guidelines or Provisional Guidelines	Criterion	TWA	STEL	Alternate Names
41 1-CHLOROBUTANE					n-BUTYL CHLORIDE
42 BENZENE	10000 (1)	3300 (A)	30000	75000	
43 TETRACHLOROMETHANE	1800 (2)	600 (A)	20000	125000	CARBON TETRACHLORIDE
44 3,3-DIMETHYLPENTANE					
45 CYCLOHEXANE	300000 (2)	100000 (A)	1050000	1300000	HEXAHYDROBENZENE
46 2,3-DIMETHYLPENTANE					
47 2-METHYLHEXANE					ISOHEPTANE
48 CYCLOHEXENE			1015000		
49 DIBROMOMETHANE					METHYLENE DIBROMIDE; METHYLENE BROMIDE
50 1,2-DICHLOROPROPANE					PROPYLENE CHLORIDE
51 3-METHYLHEXANE					
52 2,3-DICHLOROPROPENE			5000	50000	2,3-DICHLOROPROPYLENE
53 TRICHLOROETHENE	85000 (1)	28000 (A)	270000	1080000	TRICHLOROETHYLENE
54 2,2,4-TRIMETHYLPENTANE					ISOOCTANE
55 1-HEPTENE					
56 HEPTANE			1600000	2000000	*n-HEPTANE*
57 trans-2-HEPTENE					
58 METHYLCYCLOHEXANE			1600000	2000000	HEXAHYDROTOLUENE
59 2,2-DIMETHYLHEXANE					
60 ETHYLCYCLOPENTANE					

Table 5 ctd.

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

	Standards, Guidelines or Provisional Guidelines	Criterion	TWA	STEL	Alternate Names
61 4-METHYLCYCLOHEXENE					
62 2,5-DIMETHYLHEXANE					
63 1-CHLOROPENTANE					n-AMYL CHLORIDE; PENTYL CHLORIDE
64 1,1,2-TRICHLOROETHANE					VINYL TRICHLORIDE
65 2,3,4-TRIMETHYLPENTANE					
66 TOLUENE	2000 (1)	2000 (A)	375000	560000	*METHYLBENZENE*; PHENYLMETHANE
67 1,3-DICHLOROPROPANE			350000	510000	TRIMETHYLENE CHLORIDE
68 2-METHYLHEPTANE					
69 4-METHYLHEPTANE					
70 c-1,3-DIMETHYLCYCLOHEXANE					
71 3-METHYLHEPTANE					
72 1,2-DIBROMOETHANE					ETHYLENE DIBROMIDE; ETHYLENE BROMIDE
73 1,1-DIMETHYLCYCLOHEXANE					
74 1-OCTENE	150000 (3)	50000 (A)			
75 trans12DIMETHYLCYCLOHEXANE					*trans-1,2-DIMETHYLCYCLOHEXANE
76 trans-4-OCTENE					
77 TETRACHLOROETHENE	10000 (2)	4000 (A)	335000	1340000	TETRACHLOROETHYLENE; PERCHLOROETHYLENE
78 c-1,4-DIMETHYLCYCLOHEXANE					
79 OCTANE	45400 (3)	15300 (A)	1450000	1800000	*n-OCTANE*
80 trans-2-OCTENE					

Table 5 ctd.

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

	Standards, Guidelines or Provisional Guidelines	Criterion	TWA	STEL	Alternate Names
81 cis12DIMETHYLCYCLOHEXANE					
82 CHLOROBENZENE			350000		PHENYL CHLORIDE
83 ETHYLCYCLOHEXANE					
84 1-CHLOROHEXANE					n-HEXYL CHLORIDE
85 ETHYLBENZENE	4000 (1)	4000 (A)	435000	545000	
86 m,p-XYLENE	2300 (4)	2300 (A)	435000	655000	*1,3-DIMETHYLBENZENE*
87 4-METHYLOCTANE					
88 2-METHYLOCTANE					
89 3-METHYLOCTANE					
90 STYRENE	400 (1)	400 (A)	215000	425000	*ETHENYLBENZENE*; PHENYLETHYLENE; VINYLBENZENE
91 1,4-DICHLOROBUTANE					
92 o-XYLENE	2300 (4)	2300 (A)	435000	655000	*1,2-DIMETHYLBENZENE*
93 1,1,2,2-TETRACHLOROETHANE					ACETYLENE TETRACHLORIDE
94 1,2,3-TRICHLOROPROPANE			300000	450000	TRICHLOROHYDRIN
95 1-NONENE					
96 NONANE			1050000	1300000	*n-NONANE*
97 ISOPROPYLBENZENE	100 (3)	100 (B)			*(1-METHYLETHYL)BENZENE*; CUMENE
98 2-CHLOROTOLUENE					*2-CHLORO-1-METHYLBENZENE*; o-TOLYL CHLORIDE; o-CHLOROTOLUENE
99 3-CHLOROTOLUENE					*3-CHLORO-1-METHYLBENZENE*; m-TOLYL CHLORIDE; m-CHLOROTOLUENE
100 4-CHLOROTOLUENE					*4-CHLORO-1-METHYLBENZENE; p-TOLYL CHLORIDE; p-CHLOROTOLUENE

Table 5 ctd.

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

	Standards, Guidelines or Provisional Guidelines	Criterion	TWA	STEL	Alternate Names
101 PROPYLBENZENE					n-PROPYLBENZENE
102 3-ETHYLTOLUENE					*1-ETHYL-3-METHYLBENZENE*; M-ETHYLTOLUENE
103 4-ETHYLTOLUENE					*1-ETHYL-4-METHYLBENZENE*; P-ETHYLTOLUENE
104 1,3,5-TRIMETHYLBENZENE			125000	170000	MESITYLENE
105 2-ETHYLTOLUENE					*1-ETHYL-2-METHYLBENZENE*; O-ETHYLTOLUENE
106 1,2,4-TRIMETHYLBENZENE	100 (2)	1000 (A)	125000	170000	PSUEDOCUMENE
107 tert.BUTYLBENZENE					*(1,1-DIMETHYLETHYL)BENZENE*
108 tert.BUTYLCYCLOHEXANE					
109 1,3-DICHLOROBENZENE					
110 1-DECENE	180000 (3)	60000 (A)			n-DECYLENE
111 1,5-DICHLOROPENTANE					
112 isoBUTYLBENZENE					
113 DECANE					*n-DECANE*
114 sec.BUTYLBENZENE					*(1-METHYLPROPYL)BENZENE*
115 1,2,3-TRIMETHYLBENZENE			125000	175000	HEMIMELLITENE
116 1ISOPROPYL4METHYLBENZENE					*METHYL(4-METHYLETHYL)BENZENE*; 3-ISOPROPYLTOLUENE; P-CYMENE
117 1,2-DICHLOROBENZENE					o-DICHLOROBENZENE
118 INDAN					*2,3-DIHYDRO-1H-INDENE*; 2,3-DIHYDROINDENE; HYDRINDENE
119 BUTYLCYCLOHEXANE					n-BUTYLCYCLOHEXANE; 1-CYCLOHEXYLBUTANE
120 1,3-DIETHYLBENZENE					m-DIETHYLBENZENE

Table 5 ctd.

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

	Standards, Guidelines or Provisional Guidelines	Criterion	TWA	STEL	Alternate Names
121 1,4-DIETHYLBENZENE					p-DIETHYLBENZENE
122 BUTYLBENZENE					n-BUTYLBENZENE
123 1,2-DIETHYLBENZENE					o-DIETHYLBENZENE
124 transDECAHYDRONAPHTHALENE					t-DECALIN; BICYCLO[4,4,0]DECANE
125 cis-DECAHYDRONAPHTHALENE					c-DECALIN; BICYCLO[4,4,0]DECANE
126 UNDECANE					*n-UNDECANE*; HENDECANE
127 1235-TETRAMETHYLBENZENE					ISODURENE
128 1234-TETRAMETHYLBENZENE					PREHNITENE
129 1,3-DIISOPROPYLBENZENE					*1,3-BIS(1-METHYLETHYL)BENZENE*
130 1234TETRAHYDRONAPHTHALENE					TETRALIN
131 1,4-DIISOPROPYLBENZENE					*1,4-BIS(1-METHYLETHYL)BENZENE*; ISOPROPYLCUMENE
132 DODECANE					*n-DODECANE*

Table 5 ctd.

The Volatile Organic Compounds Measured by the Gas Chromatographic System of MAMU #1

All concentrations are in ug/m^3 (micrograms per cubic metre)

NOTES:

(1) Standard
(2) Guideline
(3) Provisional Guideline
(4) Standard for sum of o-, m-, & p-Xylenes

(A) Ambient Air Quality Criterion based on a 24-hour average concentration
(B) Ambient Air Quality Criterion based on a 1-hour average concentration (please note; if the maximum 1-hour average concentration of a contaminant is LESS than the Criterion concentration based on a 24-hour average, then that Criterion has NOT been exceeded.)

TWA - Time Weighted Average for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed without adverse effect.

STEL - Short Term Exposure Limit - concentration to which workers can be exposed for a short period of time (15 minutes) without adverse effect.

* - Denotes name approved by the International Union of Pure and Applied Chemistry (IUPAC).

APPENDIX A

Common Contaminants

Complete Data Set

LONDON_88 : A212

Start: 88/06/21 13:05 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: Bristol Apts. Parking Lot, Downwind

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
13:05-14:05	.8	-	nd	-	-	.02	nd	nd	-	.082	32.6	8.	978.3	6.	232.
13:20-14:20	.8	-	nd	-	-	.02	.01	nd	-	.081	32.9	8.	978.0	7.	234.
13:35-14:35	.8	-	nd	-	-	.02	.01	nd	-	.080	32.7	8.	977.6	10.	233.
13:50-14:50	.8	-	nd	-	-	.02	.01	nd	-	.079	32.7	8.	977.3	10.	239.
14:05-15:05	.7	-	nd	-	-	.02	.01	nd	.047	.078	32.3	8.	976.8	12.	234.
14:20-15:20	.7	-	nd	-	-	.02	.01	nd	.048	.076	32.4	14.	976.4	12.	236.
14:35-15:35	.8	-	nd	-	-	.02	.01	nd	.048	.074	32.6	23.	976.1	10.	243.
14:50-15:50	.9	-	nd	-	-	.02	.01	nd	.051	.072	32.9	32.	975.6	10.	241.
15:05-16:05	.9	-	nd	-	-	.03	.02	nd	.051	.070	33.2	40.	975.3	10.	249.
15:20-16:20	1.0	-	nd	-	-	.03	.02	nd	.053	.064	33.6	43.	974.8	9.	250.
15:35-16:35	.9	-	nd	-	-	.02	.01	nd	-	.060	33.5	39.	974.4	11.	237.
15:50-16:50	.7	-	nd	-	-	.02	.01	nd	-	.055	33.1	39.	973.9	12.	234.
16:05-17:05	.6	-	nd	-	-	.02	nd	nd	-	.049	32.5	39.	973.5	14.	226.

LONDON_88 : A212

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.78	-	.005	-	-	.021	.012	.007	.050	.0696	32.6	24.0	976.0	-	-
Std. Dev.	.43	-	.000	-	-	.012	.008	.006	.007	.0142	1.0	16.9	1.8	-	-
Geo. Mean	.70	-	.005	-	-	.019	.010	.006	.049	-	-	-	-	-	-
Geo.Std.Dev	1.51	-	1.000	-	-	1.674	1.894	1.621	1.263	-	-	-	-	-	-
Min Reading	.27	-	.005	-	-	.005	.005	.005	.005	.0190	29.8	7.2	973.0	.0	11.2
Max Reading	3.68	-	.005	-	-	.082	.033	.053	.063	.0836	35.0	54.2	978.7	26.0	356.5
Min Average	.60	-	.005	-	-	.016	.008	.006	.047	.0484	32.2	7.7	973.5	5.4	225.1
Max Average	1.01	-	.005	-	-	.030	.018	.010	.054	.0822	33.7	42.7	978.3	14.4	252.0
# Valid Rdgs	242.	0.	242.	0.	0.	242.	242.	242.	125.	242.	242.	242.	242.	242.	242.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

- Invalid Data / Not Calculated

nd Average is less than Min. Detectable Level

m One or more readings Missing

* Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

Averaging Started at Nearest: .0 min

Averages updated every SCAN time

LONDON_88 : A213

Start: 88/06/21 18:41　　Scan: 300 sec
Average: 60.00 min　　Report: 15.00 min
Loc: OVERNIGHT ON SHORELINE

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
18:41-19:41	.8	—	nd	—	1.35	.02	.01	nd	.022	.008	27.0	67.	970.1	13.	199.
18:56-19:56	.7	—	nd	—	1.34	.02	.01	nd	.022	.007	26.7	67.	970.0	13.	198.
19:11-20:11	.6	—	nd	—	1.36	.02	.01	nd	.024	.006	26.4	67.	970.0	13.	198.
19:26-20:26	.6	—	nd	—	1.45	.02	.01	nd	.025	.005	26.0	68.	970.0	12.	198.
19:41-20:41	.6	—	nd	—	1.42	.02	.02	nd	.023	.004	25.7	69.	969.7	10.	195.
19:56-20:56	.6	—	nd	—	1.38	.02	.02	nd	.022	.002	25.4	71.	969.5	8.	195.
20:11-21:11	.6	—	nd	—	1.25	.03	.02	nd	.019	.001	25.1	73.	969.3	7.	191.
20:26-21:26	.6	—	nd	—	1.10	.03	.02	nd	.018	.000	24.7	75.	969.0	6.	183.
20:41-21:41	.6	—	nd	—	1.07	.03	.02	nd	.018	.000	24.3	77.	969.0	5.	183.
20:56-21:56	.5	—	nd	—	1.06	.03	.02	nd	.018	.000	24.0	78.	969.0	4.	179.
21:11-22:11	.5	—	nd	—	1.05	.03	.02	nd	.019	.000	23.8	80.	969.0	3.	171.
21:26-22:26	.6	—	nd	—	1.04	.03	.02	nd	.018	.000	23.6	82.	969.0	2.	166.
21:41-22:41	.5	—	nd	—	1.03	.03	.02	nd	.018	.000	23.4	83.	969.0	2.	164.
21:56-22:56	.5	—	nd	—	1.02	.03	.02	nd	.018	.000	23.2	85.	969.0	2.	167.
22:11-23:11	.5	—	nd	—	1.02	.03	.03	nd	.017	.000	23.0	87.	969.3	2.	176.
22:26-23:26	.5	—	nd	—	1.01	.04	.03	nd	.016	.000	22.9	88.	969.4	2.	184.
22:41-23:41	.6	—	nd	—	1.01	.04	.03	nd	.014	.000	22.8	90.	969.6	2.	187.
22:56-23:56	.6	—	nd	—	1.01	.04	.03	nd	.015	.000	22.7	92.	969.8	3.	191.
23:11-00:11	.6	—	nd	—	1.10	.05	.04	nd	.014	.000	22.6	94.	969.8	3.	195.
23:26-00:26	.5	—	nd	—	1.56	.04	.04	nd	.017	.000	22.4	96.	969.8	4.	196.
23:41-00:41	.5	—	nd	—	1.83	.04	.03	nd	.020	.000	22.3	98.	969.6	5.	195.
23:56-00:56	.5	—	nd	—	1.84	.03	.03	nd	.023	.000	22.2	99.	969.4	5.	194.
88/06/22															
00:11-01:11	.4	—	nd	—	1.74	.02	.02	nd	.026	.000	22.1	100.	969.1	4.	190.
00:26-01:26	.4	—	nd	—	1.28	.02	.02	nd	.026	.000	22.0	100.	969.1	3.	188.
00:41-01:41	.4	—	nd	—	1.01	.03	.02	nd	.024	.000	22.0	100.	969.0	2.	187.
00:56-01:56	.5	—	nd	—	1.00	.03	.03	nd	.022	.000	22.0	100.	969.0	1.	188.
01:11-02:11	.5	—	nd	—	1.00	.04	.03	nd	.021	.000	22.0	100.	969.0	2.	194.

01:26-02:26	.5	—	nd	—	1.08	.04	.04	nd	.021	.000	22.0	100.	969.0	2.	196.
01:41-02:41	.6	—	nd	—	1.28	.04	.04	nd	.022	.000	22.1	100.	969.0	3.	198.
01:56-02:56	.6	—	nd	—	1.30	.04	.03	nd	.025	.000	22.4	100.	969.0	4.	199.
02:11-03:11	.6	—	nd	—	1.30	.03	.03	nd	.028	.000	22.7	100.	969.0	4.	200.
02:26-03:26	.6	—	nd	—	1.22	.03	.03	nd	.031	.000	23.0	100.	969.0	5.	202.
02:41-03:41	.6	—	nd	—	1.01	.03	.02	nd	.033	.000	23.2	100.	969.0	5.	203.
02:56-03:56	.6	—	nd	—	1.00	.02	.02	nd	.033	.000	23.1	100.	969.0	5.	205.

LONDON_88 : A213

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
03:11-04:11	.6	—	nd	—	1.01	.03	.02	nd	.032	.000	23.0	100.	969.0	3.	208.
03:26-04:26	.6	—	nd	—	1.01	.03	.02	nd	.030	.000	22.9	100.	969.0	2.	212.
03:41-04:41	.6	—	nd	—	1.03	.03	.02	nd	.030	.000	22.9	100.	969.0	2.	217.
03:56-04:56	.6	—	nd	—	1.04	.03	.03	nd	.030	.000	23.0	-	969.0	2.	223.
04:11-05:11	.6	—	nd	—	1.05	.04	.03	nd	.029	.000	23.0	-	969.0	2.	224.
04:26-05:26	.7	—	nd	—	1.05	.04	.03	nd	.029	.000	23.2	-	969.0	2.	224.
04:41-05:41	.7	—	nd	—	1.04	.04	.03	nd	.029	.000	23.4	-	969.0	2.	225.
04:56-05:56	.7	—	nd	—	1.02	.03	.03	nd	.030	.000	23.6	-	969.0	3.	231.
05:11-06:11	.7	—	nd	—	1.02	.03	.02	nd	.031	.000	23.9	-	969.0	4.	235.
05:26-06:26	.8	—	nd	—	1.03	.03	.02	nd	.031	.000	24.2	-	969.0	4.	235.
05:41-06:41	.8	—	nd	—	1.03	.04	.03	nd	.028	.000	24.5	-	969.0	5.	232.
05:56-06:56	.9	—	nd	—	1.04	.04	.03	.01	.027	.001	24.7	-	969.0	6.	225.
06:11-07:11	1.0	—	nd	—	1.06	.05	.04	.01	.024	.001	25.0	-	969.0	7.	217.

LONDON_88 : A213

Statistics	CO	TRC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.62	—	.005	—	1.172	.032	.026	.006	.024	.0011	23.7	88.4	969.3	-	-
Std. Dev.	.16	—	.000	—	.350	.014	.011	.004	.007	.0025	1.5	12.9	.4	-	-
Geo. Mean	.60	—	.005	—	1.138	.030	.023	.006	.023	-	-	-	-	-	-
Geo.Std.Dev	1.25	—	1.000	—	1.245	1.494	1.657	1.425	1.353	-	-	-	-	-	-
Min Reading	.40	—	.005	—	.982	.013	.005	.005	.007	.0000	21.9	66.2	969.0	.0	110.6
Max Reading	1.24	—	.005	—	3.194	.084	.057	.026	.038	.0123	27.7	100.0	970.6	16.4	248.5
Min Average	.44	—	.005	—	.995	.017	.011	.005	.014	.0000	22.0	66.6	969.0	1.3	163.7
Max Average	.98	—	.005	—	1.840	.057	.040	.015	.034	.0080	27.0	100.0	970.1	13.4	235.4
# Valid Rdgs	151.	0	151.	0	151.	151.	151.	151.	151.	151.	151.	120.	151.	151.	151.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	—	.250	—	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

Averaging Started at Nearest: .0 min

Averages updated every SCAN time

```
                                                                              LONDON_88 : A222

                                                                Start: 88/06/22  08:25        Scan:      60  sec
                                                                Average:  60.00 min          Report:  15.00  min
                                                                Loc: ARLINGTON CR./RENFRO CR. D.W.

Time           CO       TMC      SO2      Non-CH4    Methane    NOx      NO2      NO       Ozone     SolarRad   Temp     Humidity   Barom      Wind-Spd   Wind-Dir

08:25-09:25    .6       2.83     nd       1.50       1.32       .03      .03      nd       .023      .016       28.2     79.        971.2      22.        249.


LONDON_88 : A222

Statistics     CO       TMC      SO2      Non-CH4    Methane    NOx      NO2      NO       Ozone     SolarRad   Temp     Humidity   Barom      Wind-Spd   Wind-Dir

Units          ppm      ppm      ppm      ppm        ppm        ppm      ppm      ppm      ppm       W/cm^2     d C      %-rel      mbar-msl   km/h       deg

Arith. Mean    .62      2.837    .008     1.505      1.318      .034     .027     .005     .024      .0166      28.3     77.2       971.2      -          -
Std. Dev.      .20      .044     .003     .045       .005       .009     .007     .000     .008      .0029      .5       20.4       .2         -          -
Geo. Mean      .59      2.837    .007     1.505      1.318      .033     .026     .005     .022      -          -        -          -          -          -
Geo.Std.Dev    1.36     1.016    1.530    1.030      1.004      1.276    1.300    1.000    1.404     -          -        -          -          -          -
Min Reading    .39      2.730    .005     1.409      1.309      .023     .016     .005     .010      .0108      27.4     53.2       971.1      11.9       227.0
Max Reading    .97      2.899    .013     1.573      1.328      .051     .042     .005     .035      .0220      29.2     100.0      971.7      34.3       287.0
Min Average    .60      2.835    .008     1.503      1.318      .034     .027     .005     .023      .0163      28.2     76.0       971.2      21.8       249.2
Max Average    .62      2.843    .008     1.512      1.319      .035     .027     .005     .024      .0170      28.3     78.0       971.2      22.1       252.1
# Valid Rdgs   64.      64.      64.      64.        64.        64.      64.      64.      64.       64.        64.      63.        64.        64.        64.
Min.Det.Lev    .10      .100     .010     .100       .100       .010     .010     .010     .004      -          -        -          950.0      -          -
1 hr Crit.     30.00    -        .250     -          -          -        .200     -        .080      -          -        -          -          -          -


 -   Invalid Data / Not Calculated
nd   Average is less than Min. Detectable Level
 m   One or more readings Missing
 *   Average is above Provincial Std/Criteria
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                                                                                 LONDON_88 : A223

                                                        Start: 88/06/22  10:12        Scan:       60  sec
                                                        Average:  60.00 min        Report:    15.00  min
                                                        Loc: Glencairn Public School

Time          CO        THC       SO2       Non-CH4   Methane   NOx       NO2       NO        Ozone     SolarRad  Temp      Humidity  Barom     Wind-Spd  Wind-Dir

 LONDON_88 : A223         ( Insufficient data for 1-hr ave. )



Statistics    CO        THC       SO2       Non-CH4   Methane   NOx       NO2       NO        Ozone     SolarRad  Temp      Humidity  Barom     Wind-Spd  Wind-Dir

Units         ppm       ppm       ppm       ppm       ppm       ppm       ppm       ppm       ppm       W/cm^2    d C       %-rel     mbar-msl  km/h       deg

Arith. Mean     .69     2.436      .005     1.212     1.185      .016      .009      .005      .031     .0547     29.9      51.3     984.1        -         -
Std. Dev.       .10      .039      .001      .034      .007      .002      .003      .000      .003     .0083       .2        .6        .0        -         -
Geo. Mean       .68     2.436      .005     1.212     1.185      .016      .008      .005      .031       -         -         -         -          -         -
Geo.Std.Dev    1.18     1.016     1.207     1.029     1.006     1.164     1.530     1.000     1.101       -         -         -         -          -         -
Min Reading     .43     2.337      .005     1.115     1.167      .012      .005      .005      .025     .0344     29.4      50.1     984.1      23.7     276.3
Max Reading     .82     2.484      .010     1.255     1.190      .020      .015      .005      .036     .0678     30.3      52.3     984.3      46.6     317.8
# Valid Rdgs  41.       41.       41.       41.       41.       41.       41.       41.       41.       41.       41.       41.       41.       41.       41.
Min.Det.Lev     .10      .100      .010      .100      .100      .010      .010      .010      .004       -         -         -       950.0        -         -
1 hr Crit.    30.00       -        .250       -         -         -        .200       -        .080       -         -         -         -          -         -


  -   Invalid Data / Not Calculated
 md   Average is less than Min. Detectable Level
  m   One or more readings Missing
  *   Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average:  90.0 %
Averaging Started at Nearest:                     .0 min
Averages updated every SCAN time
```

LONDON_88 : A224

Start: 88/06/22 12:00 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: PARLIAMENT CR.(#53) D.W.

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
12:00-13:00	.3	2.41	nd	.87	1.50	.01	nd	nd	.036	.038	29.1	49.	983.2	34.	297.
12:15-13:15	.3	2.63	nd	.94	1.66	.01	nd	nd	.037	.037	28.8	50.	982.6	28.	292.
12:30-13:30	.4	2.65	nd	.91	1.70	nd	nd	nd	.038	.033	28.7	49.	981.9	22.	289.
12:45-13:45	.4	2.60	nd	.85	1.71	nd	nd	nd	.038	.028	28.6	49.	981.3	18.	285.
13:00-14:00	.5	2.33	nd	.72	1.58	nd	nd	nd	.039	.029	28.7	48.	980.8	15.	280.
13:15-14:15	.6	1.98	nd	.58	1.37	.01	nd	nd	.040	.034	29.2	47.	980.4	14.	270.
13:30-14:30	.7	1.81	nd	.52	1.26	.02	nd	.01	.042	.038	29.5	47.	980.1	14.	262.
13:45-14:45	1.0	1.71	nd	.51	1.16	.03	nd	.02	.043	.044	30.2	46.	979.8	12.	250.

LONDON_88 : A224

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.64	2.166	.005	.718	1.409	.017	.008	.009	.042	.0376	29.5	47.6	981.2	-	-
Std. Dev.	.62	.526	.000	.227	.320	.015	.005	.010	.031	.0109	1.0	1.8	1.6	-	-
Geo. Mean	.50	2.107	.005	.682	1.377	.013	.007	.007	.040	-	-	-	-	-	-
Geo.Std.Dev	1.85	1.261	1.000	1.385	1.234	2.054	1.618	1.872	1.231	-	-	-	-	-	-
Min Reading	.19	1.505	.005	.363	1.096	.005	.005	.005	.029	.0198	28.2	43.7	979.0	4.0	212.6
Max Reading	3.56	3.706	.005	1.295	2.383	.092	.031	.065	.444	.0757	31.9	50.8	983.9	60.0	320.5
Min Average	.32	1.683	.005	.511	1.133	.007	.005	.005	.036	.0272	28.6	45.5	979.6	12.2	243.3
Max Average	1.13	2.700	.005	.952	1.713	.029	.010	.017	.050	.0457	30.6	49.5	983.2	33.9	297.3
# Valid Rdgs	174.	174.	174.	174.	174.	174.	174.	174.	174.	174.	174.	174.	174.	174.	174.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %
Averaging Started at Nearest: .0 min
Averages updated every SCAN time

LONDON_88 : A225

Start: 88/06/22 16:53 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: THOMPSON RD 1.3 KM N OF EFW

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
16:53-17:53	1.8	2.70	nd	1.37	1.28	.04	.02	.01	.072	.020	33.7	43.	978.0	11.	267.

LONDON_88 : A225

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	1.87	2.703	.005	1.379	1.281	.038	.025	.011	.072	.0197	33.7	43.4	978.0	-	-
Std. Dev.	.79	.216	.001	.212	.023	.017	.010	.008	.052	.0118	.5	.5	.4	-	-
Geo. Mean	1.73	2.695	.005	1.364	1.281	.035	.023	.009	.061	-	-	-	-	-	-
Geo.Std.Dev	1.45	1.081	1.147	1.159	1.018	1.464	1.559	1.854	1.866	-	-	-	-	-	-
Min Reading	1.04	2.428	.005	1.081	1.243	.016	.005	.005	.002	.0063	32.9	42.2	977.2	1.2	195.2
Max Reading	4.60	3.275	.011	1.979	1.345	.105	.056	.047	.297	.0513	34.9	44.4	978.7	26.3	355.0
Min Average	1.82	2.696	.005	1.372	1.280	.036	.024	.010	.072	.0187	33.7	43.4	978.0	10.7	267.1
Max Average	1.85	2.707	.005	1.383	1.281	.038	.025	.011	.072	.0202	33.7	43.5	978.0	11.1	267.8
# Valid Rdgs	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

LONDON_88 : A232

Start: 88/06/23 09:02 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: TOURISM INFO PKG LOT OFF WELL.

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
09:02-10:02	.3	1.88	nd	.73	1.14	.01	nd	nd	.012	.055	20.1	55.	994.1	18.	4.

LONDON_88 : A232

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.25	1.884	.005	.736	1.142	.014	.005	.007	.013	.0565	20.2	53.9	994.2	-	-
Std. Dev.	.11	.022	.000	.026	.010	.005	.001	.004	.006	.0048	.6	5.5	.2	-	-
Geo. Mean	.22	1.884	.005	.736	1.142	.014	.005	.007	.011	-	-	-	-	-	-
Geo.Std.Dev	1.70	1.012	1.000	1.035	1.009	1.441	1.217	1.520	2.000	-	-	-	-	-	-
Min Reading	.05	1.839	.005	.698	1.119	.005	.005	.005	.002	.0482	18.9	44.4	993.8	8.0	.8
Max Reading	.45	1.946	.005	.819	1.160	.027	.011	.016	.022	.0643	21.3	62.3	994.6	35.0	359.7
Min Average	.23	1.880	.005	.730	1.142	.013	.005	.006	.012	.0553	20.1	52.6	994.1	17.6	.9
Max Average	.27	1.883	.005	.734	1.145	.014	.005	.007	.015	.0577	20.2	55.4	994.2	19.8	360.0
# Valid Rdgs	70.	70.	70.	70.	70.	70.	70.	70.	70.	70.	70.	70.	70.	70.	70.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

LONDON_88 : A233

Start: 88/06/23 10:58 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: EBURY CR.(BY #97) DOWNWIND

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
10:58-11:58	.8	2.13	nd	.96	1.16	.03	nd	.02	.024	.071	23.9	37.	995.3	10.	354.
11:13-12:13	.7	2.10	nd	.93	1.15	.03	nd	.02	.025	.081	24.1	35.	995.4	10.	352.
11:28-12:28	.7	2.09	nd	.92	1.15	.03	nd	.02	.025	.083	24.3	35.	995.4	10.	350.
11:43-12:43	.7	2.09	nd	.93	1.15	.03	nd	.02	.025	.085	24.4	34.	995.4	10.	348.
11:58-12:58	.6	2.11	nd	.95	1.15	.03	nd	.02	.025	.086	24.2	35.	995.4	10.	344.
12:13-13:13	.7	2.15	nd	.98	1.15	.04	nd	.03	.025	.087	24.2	34.	995.4	11.	340.
12:28-13:28	.6	2.18	nd	1.02	1.14	.03	nd	.02	.026	.087	24.4	34.	995.4	10.	340.
12:43-13:43	.6	2.27	nd	1.12	1.14	.03	nd	.02	.026	.088	24.5	34.	995.4	10.	342.
12:58-13:58	.5	2.36	nd	1.19	1.15	.03	nd	.02	.026	.088	24.8	33.	995.4	9.	347.
13:13-14:13	.5	2.42	nd	1.24	1.15	.03	nd	.02	.026	.088	24.9	33.	995.4	9.	342.
13:28-14:28	.5	2.45	nd	1.27	1.16	.03	nd	.02	.026	.087	24.8	33.	995.3	10.	341.

LONDON_88 : A233

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.64	2.234	.005	1.064	1.154	.029	.006	.022	.025	.0824	24.3	34.6	995.4	-	-
Std. Dev.	.49	.194	.000	.185	.017	.018	.003	.015	.002	.0117	.6	1.8	.1	-	-
Geo. Mean	.49	2.226	.005	1.049	1.154	.023	.006	.017	.025	-	-	-	-	-	-
Geo.Std.Dev	2.13	1.086	1.000	1.175	1.015	2.061	1.397	2.103	1.064	-	-	-	-	-	-
Min Reading	.05	2.004	.005	.855	1.083	.005	.005	.005	.020	.0228	22.7	31.2	995.1	1.1	.6
Max Reading	3.45	3.292	.005	2.033	1.196	.091	.020	.072	.029	.0887	25.6	40.9	995.6	26.8	359.5
Min Average	.47	2.085	.005	.920	1.139	.026	.006	.019	.024	.0710	23.9	33.0	995.3	9.0	338.0
Max Average	.81	2.464	.005	1.278	1.163	.036	.007	.027	.026	.0879	24.9	36.5	995.4	10.9	356.1
# Valid Rdgs	212.	212.	212.	212.	212.	212.	212.	212.	212.	212.	212.	212.	212.	212.	212.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

Averaging Started at Nearest: .0 min

Averages updated every SCAN time

LONDON_88 : A234

Start: 88/06/23 14:52 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: Arthur Stringer Public School

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
14:52-15:52	.2	2.18	nd	1.01	1.16	.01	nd	nd	.028	.079	22.9	35.	995.1	20.	330.
15:07-16:07	.2	2.13	nd	.96	1.15	.02	nd	.01	.028	.077	22.8	35.	995.1	21.	326.
15:22-16:22	.2	2.09	nd	.93	1.15	.02	nd	.01	.028	.074	22.5	35.	995.1	22.	330.
15:37-16:37	.3	2.08	nd	.92	1.15	.02	nd	.01	.027	.071	22.5	35.	995.1	21.	327.
15:52-16:52	.4	2.09	nd	.93	1.15	.02	nd	.01	.027	.068	22.5	35.	995.0	20.	329.
16:07-17:07	.4	2.10	nd	.94	1.15	.02	nd	nd	.027	.065	22.5	36.	995.0	20.	326.
16:22-17:22	.5	2.11	nd	.95	1.14	.02	nd	nd	.026	.061	22.5	36.	995.1	18.	323.
16:37-17:37	.5	2.11	nd	.95	1.15	.02	nd	nd	.027	.058	22.4	36.	995.0	19.	325.
16:52-17:52	.5	2.09	nd	.94	1.14	.02	nd	nd	.027	.054	22.1	37.	995.1	19.	323.
17:07-18:07	.5	2.08	nd	.93	1.14	.01	nd	nd	.027	.050	22.3	36.	995.1	17.	327.

LONDON_88 : A234

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.36	2.110	.005	.948	1.148	.015	.005	.010	.027	.0637	22.5	35.7	995.1	-	-
Std. Dev.	.23	.084	.000	.073	.019	.009	.001	.006	.001	.0130	.6	.9	.2	-	-
Geo. Mean	.29	2.108	.005	.945	1.148	.013	.005	.008	.027	-	-	-	-	-	-
Geo.Std.Dev	2.10	1.040	1.000	1.077	1.016	1.853	1.201	1.754	1.056	-	-	-	-	-	-
Min Reading	.05	1.907	.005	.789	1.109	.005	.005	.005	.022	.0405	21.2	33.6	992.9	4.2	.1
Max Reading	1.68	2.474	.005	1.277	1.205	.060	.014	.047	.031	.0832	23.9	38.1	995.2	38.3	359.6
Min Average	.16	2.058	.005	.903	1.137	.014	.005	.008	.026	.0471	22.1	35.0	995.0	16.8	322.3
Max Average	.54	2.182	.005	1.010	1.156	.019	.006	.013	.028	.0790	22.9	36.7	995.1	22.2	330.3
# Valid Rdgs	208.	208.	208.	208.	208.	208.	208.	208.	208.	208.	208.	208.	208.	208.	208.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

Averaging Started at Nearest: .0 min

Averages updated every SCAN time

LONDON_88 : A235

Start: 88/06/23 18:58 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: UPW AT VICT HOSP PKG LOT

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
18:58-19:58	.5	1.99	nd	.87	1.11	.02	nd	.01	.027	.018	21.0	34.	999.0	16.	334.

LONDON_88 : A235

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.54	1.987	.005	.862	1.114	.021	.007	.011	.027	.0161	20.7	33.9	999.0	-	-
Std. Dev.	.20	.053	.000	.046	.008	.012	.003	.010	.002	.0084	.9	1.1	.1	-	-
Geo. Mean	.51	1.986	.005	.860	1.114	.019	.007	.009	.027	-	-	-	-	-	-
Geo.Std.Dev	1.43	1.026	1.000	1.053	1.007	1.571	1.513	1.905	1.068	-	-	-	-	-	-
Min Reading	.19	1.908	.005	.791	1.102	.005	.005	.005	.021	.0040	19.1	32.5	998.9	7.3	.9
Max Reading	1.65	2.158	.005	1.011	1.131	.071	.015	.055	.030	.0317	22.0	36.5	999.2	28.0	359.6
Min Average	.52	1.984	.005	.859	1.113	.020	.007	.010	.027	.0138	20.5	33.6	999.0	15.6	334.0
Max Average	.54	1.992	.005	.865	1.114	.022	.007	.012	.027	.0179	21.0	34.1	999.0	16.1	336.9
# Valid Rdgs	71.	71.	71.	71.	71.	71.	71.	71.	71.	71.	71.	71.	71.	71.	71.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

LONDON_88 : A236

Start: 88/06/23 20:35 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: Arthur Stringer Public School

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
20:35-21:35	.9	2.44	nd	1.09	1.35	.04	.01	.02	.025	.000	16.3	39.	995.6	2.	349.

LONDON_88 : A236

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.87	2.459	.005	1.098	1.351	.036	.015	.020	.024	.0003	16.2	39.3	995.6	-	-
Std. Dev.	1.18	.410	.000	.346	.105	.042	.006	.039	.004	.0005	.7	3.0	.2	-	-
Geo. Mean	.71	2.431	.005	1.061	1.347	.029	.013	.011	.024	-	-	-	-	-	-
Geo.Std.Dev	1.58	1.161	1.000	1.277	1.082	1.770	1.646	2.424	1.195	-	-	-	-	-	-
Min Reading	.44	1.936	.005	.790	1.133	.017	.005	.005	.013	.0000	15.4	35.2	995.3	.0	2.4
Max Reading	9.15	4.380	.005	2.957	1.590	.288	.032	.260	.030	.0016	17.5	43.3	995.9	13.4	358.5
Min Average	.88	2.444	.005	1.088	1.346	.036	.014	.020	.024	.0002	16.2	39.1	995.6	1.6	349.5
Max Average	.88	2.467	.005	1.105	1.352	.037	.015	.020	.025	.0003	16.3	39.4	995.6	1.9	350.6
# Valid Rdgs	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.	62.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

LONDON_88 : A242

Start: 88/06/24 09:54 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: WHETTER AVE. (BY 751) ROWNTREE PK

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
09:54-10:54	.8	2.31	nd	1.07	1.23	.04	.02	.03	.021	.063	22.8	42.	1003.8	5.	142.
10:09-11:09	.9	2.37	nd	1.13	1.24	.05	.02	.03	.022	.065	23.4	41.	1003.7	4.	162.

LONDON_88 : A242

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.90	2.380	.006	1.136	1.235	.050	.017	.032	.022	.0651	23.3	41.1	1003.7	-	-
Std. Dev.	.75	.215	.002	.208	.009	.026	.004	.022	.002	.0042	1.2	1.2	.3	-	-
Geo. Mean	.70	2.371	.005	1.120	1.235	.045	.017	.026	.022	-	-	-	-	-	-
Geo.Std.Dev	2.03	1.089	1.264	1.179	1.008	1.570	1.262	1.916	1.098	-	-	-	-	-	-
Min Reading	.15	2.141	.005	.914	1.219	.020	.010	.005	.018	.0577	21.1	37.9	1003.2	.0	68.3
Max Reading	5.24	3.285	.012	2.018	1.277	.163	.033	.126	.027	.0732	25.7	43.3	1004.2	15.7	335.5
Min Average	.78	2.306	.005	1.065	1.233	.042	.016	.025	.021	.0629	22.8	40.7	1003.6	4.0	142.2
Max Average	1.02	2.438	.006	1.191	1.237	.054	.018	.034	.023	.0670	23.9	41.7	1003.8	5.1	172.9
# Valid Rdgs	85.	85.	85.	85.	85.	85.	85.	85.	85.	85.	85.	85.	85.	85.	85.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

- Invalid Data / Not Calculated
nd Average is less than Min. Detectable Level
m One or more readings Missing
* Average is above Provincial Std/Criteria

LONDON_88 : A243

Start: 88/06/24 12:34 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: 200m SOUTH/WEST OF STACK(UPWIND)

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
12:34-13:34	.7	2.93	nd	1.64	1.26	.02	nd	.01	.038	.080	26.2	32.	999.9	6.	173.

LONDON_88 : A243

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.76	2.943	.005	1.658	1.262	.020	.008	.011	.038	.0800	26.3	32.1	999.8	-	-
Std. Dev.	.62	.135	.001	.123	.014	.021	.005	.016	.002	.0091	.7	1.4	.3	-	-
Geo. Mean	.63	2.940	.005	1.654	1.262	.016	.007	.007	.038	-	-	-	-	-	-
Geo.Std.Dev	1.70	1.044	1.201	1.070	1.011	1.887	1.619	2.079	1.047	-	-	-	-	-	-
Min Reading	.20	2.838	.005	1.562	1.246	.005	.005	.005	.031	.0407	24.4	29.9	999.1	.0	13.6
Max Reading	3.86	3.643	.011	2.325	1.325	.119	.027	.089	.040	.0897	27.7	35.4	1000.3	17.3	315.6
Min Average	.74	2.926	.005	1.645	1.259	.021	.007	.011	.038	.0796	26.2	32.0	999.8	5.5	172.9
Max Average	.80	2.945	.005	1.660	1.262	.022	.008	.011	.038	.0797	26.3	32.3	999.9	5.9	178.9
# Valid Rdgs	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

LONDON_88 : A244

Start: 88/06/24 14:06 Scan: 60 sec
Average: 60.00 min Report: 15.00 min
Loc: HERKIMER ST.(247)ROWNTREE PK

Time	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
14:06-15:06	.8	3.22	nd	1.92	1.28	.03	.01	.01	.041	.079	27.6	29.	1001.2	5.	149.
14:21-15:21	.6	3.22	nd	1.92	1.28	.02	.01	nd	.044	.077	27.4	29.	1000.9	6.	142.
14:36-15:36	.4	3.26	nd	1.95	1.28	.01	nd	nd	.045	.075	27.2	29.	1000.6	7.	140.
14:51-15:51	.6	3.35	nd	2.03	1.29	.02	nd	nd	.046	.074	27.7	29.	1000.3	6.	152.
15:06-16:06	1.0	3.51	nd	2.17	1.30	.03	.01	.02	.046	.071	28.2	28.	1000.1	5.	171.
15:21-16:21	1.2	3.64	nd	2.30	1.31	.05	.01	.03	.045	.068	28.7	27.	999.8	5.	176.
15:36-16:36	1.3	3.72	nd	2.37	1.32	.05	.02	.03	.044	.065	29.0	26.	999.5	5.	191.

LONDON_88 : A244

Statistics	CO	THC	SO2	Non-CH4	Methane	NOx	NO2	NO	Ozone	SolarRad	Temp	Humidity	Barom	Wind-Spd	Wind-Dir
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	W/cm^2	d C	%-rel	mbar-msl	km/h	deg
Arith. Mean	.90	3.457	.005	2.131	1.295	.034	.014	.019	.044	.0697	28.2	27.5	1000.2	-	-
Std. Dev.	1.08	.317	.001	.297	.020	.039	.007	.034	.004	.0114	1.0	1.9	.9	-	-
Geo. Mean	.66	3.444	.005	2.113	1.295	.024	.012	.009	.043	-	-	-	-	-	-
Geo.Std.Dev	1.97	1.090	1.160	1.135	1.016	2.110	1.801	2.643	1.097	-	-	-	-	-	-
Min Reading	.24	3.068	.005	1.772	1.267	.005	.005	.005	.032	.0333	25.8	23.7	998.7	.0	87.6
Max Reading	7.64	5.100	.011	3.712	1.373	.288	.036	.246	.049	.0816	29.7	32.1	1001.8	19.6	354.1
Min Average	.44	3.219	.005	1.915	1.276	.014	.008	.005	.041	.0587	27.2	25.9	999.3	4.7	137.6
Max Average	1.33	3.742	.005	2.394	1.315	.053	.018	.034	.046	.0788	29.0	29.3	1001.2	7.5	191.2
# Valid Rdgs	162.	162.	162.	162.	162.	162.	162.	162.	162.	162.	162.	162.	162.	162.	162.
Min.Det.Lev	.10	.100	.010	.100	.100	.010	.010	.010	.004	-	-	-	950.0	-	-
1 hr Crit.	30.00	-	.250	-	-	-	.200	-	.080	-	-	-	-	-	-

-	Invalid Data / Not Calculated
nd	Average is less than Min. Detectable Level
m	One or more readings Missing
*	Average is above Provincial Std/Criteria

Percent Valid Data Required for Valid Average: 90.0 %

Averaging Started at Nearest: .0 min

Averages updated every SCAN time

APPENDIX B

Volatile Organic Compounds

Complete Data Set

	A212	A213	A222	A223	A224_1	A224_2	A232	A233_1	A233_2	A234_1	A234_2	A235	A242	A243	A244
	1448-1548	1611-1711	0820-0920	1017-1047	1203-1303	1400-1500	0900-1000	1050-1150	1240-1340	1450-1550	1650-1750	1855-1955	1000-1100		1410-1510
	JUN 21/88	JUN 21/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 24/88	JUN 24/88	JUN 24/88
	15:52	17:13	09:25	10:57	13:09	15:05	10:05	11:55	13:44	15:55	17:53	19:59	11:06	13:33	15:13
1 PROPANE	D	ND	12.3	13.0	ND	D	D	D	D	D (1)	D	D	D (1)		5.9 (1)
2 PROPADIENE								ND	ND					ND	
3 PROPYNE	ND								ND					ND	
4 CYCLOPROPANE															
5 2-METHYLPROPANE	D		9.0	D			D	D	19.9	5.9	D	D		5.4	16.0
6 CHLOROETHENE															
7 1-BUTENE	D	ND	D	ND	ND	D		ND	D	ND	ND	ND	D	ND	D
8 1,3-BUTADIENE	ND	ND	ND			D (1)			D (1)					ND	ND
9 BUTANE	13.2 (1)	11.0 (1)	25.1 (1)	11.9	5.4	10.5 (1)	6.3	14.7	48.1 (1)	14.8	D	10.1	8.7 (1)	13.0 (1)	41.5 (1)
10 1-BUTYNE															
11 CHLOROETHANE			ND												
12 3-METHYL-1-BUTENE			ND						ND						ND
13 2-METHYLBUTANE	13.2	9.9	21.6	12.5	5.5	10.8 (1)	8.5	15.2	24.5	13.3	D	10.6	10.3 (1)	11.7	33.0
14 2-METHYL-1-BUTENE	ND								D (1)						
15 PENTANE	7.0 (1)	D	12.0	5.5	D	6.3 (1)	D	8.4	10.0 (1)	D	D	D	6.2 (1)	6.5	16.7
16 2-METHYL-1,3-BUTADIENE	6.2	7.3	D		ND	D (1)		ND	6.9		D				
17 trans-2-PENTENE	D	D	D	ND	ND	D		D (1)	D	D (1)		D		ND	D
18 cis-2-PENTENE	ND	ND	ND			ND		ND	ND			ND		ND	ND
19 DICHLOROMETHANE			D	D		D							D (1)		
20 2-METHYL-2-BUTENE	ND	ND	ND						ND	ND	ND	ND			
21 2,2-DIMETHYLBUTANE	ND	ND	D	ND	ND	ND	ND	D (1)	ND	ND		ND	ND	ND	D
22 trans-1,2-DICHLOROETHENE															
23 3-METHYL-1-PENTENE								ND							
24 4-METHYL-1-PENTENE								ND							
25 CYCLOPENTANE	ND	ND	ND	ND	ND	D (1)	ND	ND	ND	ND	ND	ND	D (1)	ND	D (1)
26 2,3-DIMETHYLBUTANE	D (1)	ND	D (1)	ND	ND	D (1)	ND	D (1)	D (1)	ND	ND	ND	D (1)	D (1)	D (1)
27 2-METHYLPENTANE	D	D	8.0	D	D	5.4 (1)	D (1)	7.0	5.1	D (1)	D	D	5.0 (1)	5.4	9.9
28 3-METHYLPENTANE	D	D	5.1	D	D	D (1)	D (1)	D	D	D	ND	D	D (1)	D	6.0 (1)
29 1-HEXENE	ND					ND		ND	ND				ND	ND	ND
30 cis-1,2-DICHLOROETHENE															
31 2-CHLOROBUTANE							ND	ND						ND	
32 HEXANE	D	D	5.9	D (1)	D (1)		D	5.0	D	D	ND	D (1)	D (1)	D	6.0
33 1-CHLORO-2-METHYLPROPANE															
34 TRICHLOROMETHANE															

	A212	A213	A222	A223	A224_1	A224_2	A232	A233_1	A233_2	A234_1	A234_2	A235	A242	A243	A244
	1448-1548	1611-1711	0820-0920	1017-1047	1203-1303	1400-1500	0900-1000	1050-1150	1240-1340	1450-1550	1650-1750	1855-1955	1000-1100		1410-1510
	JUN 21/88	JUN 21/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 24/88	JUN 24/88	JUN 24/88
	15:52	17:13	09:25	10:57	13:09	15:05	10:05	11:55	13:44	15:55	17:53	19:59	11:06	13:33	15:13
35 3-CHLORO-2-METHYLPROPENE	ND												5.1 (1)		ND
36 METHYLCYCLOPENTANE	D (1)	ND	D (1)		ND	D (1)	ND	D (1)	D (1)	ND	ND	ND	D (1)	D (1)	D (1)
37 2,2-DIMETHYLPENTANE	ND		ND	D (1)		ND	ND	ND	ND				ND	ND	ND
38 1,2-DICHLOROETHANE													1333.0 (1)		
39 2,4-DIMETHYLPENTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
40 1,1,1-TRICHLOROETHANE	10.7	11.6 (1)	18.5	24.8	11.4 (1)		15.0	7.9 (1)	8.5 (1)	11.6	9.1 (1)		14.6 (1)	14.9 (1)	12.6 (1)
41 1-CHLOROBUTANE															
42 BENZENE	D (1)		D (1)	D	D (1)	D (1)	D (1)	D (1)	D (1)	ND	ND	D (1)	5.5 (1)	D (1)	D (1)
43 TETRACHLOROMETHANE			D (1)		D (1)					D (1)					
44 3,3-DIMETHYLPENTANE			ND					ND				ND	ND	ND	ND
45 CYCLOHEXANE	ND		ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
46 2,3-DIMETHYLPENTANE		D (1)								ND	ND	D (1)			
47 2-METHYLHEXANE	D	1.0 (1)	D	D	ND	D (1)	D	D	D		ND	D (1)	D (1)	D	D
48 CYCLOHEXENE															
49 DIBROMOMETHANE		ND	D (1)										D (1)		
50 1,2-DICHLOROPROPANE															
51 3-METHYLHEXANE	D		D (1)	D	ND	D	D	D	D	ND	ND	ND	D (1)	D	D
52 2,3-DICHLOROPROPENE															
53 TRICHLOROETHENE			ND												
54 2,2,4-TRIMETHYLPENTANE	D	D	D (1)	D	D	D	5.7	D (1)	D		ND	D	D	D (1)	D
55 1-HEPTENE															
56 HEPTANE	ND	ND	D	ND	ND	D	D	D	D			ND	D	D	D
57 trans-2-HEPTENE															
58 METHYLCYCLOHEXANE	ND	ND	ND	ND	ND	ND	D	ND	ND	ND	ND	ND	ND	D	ND
59 2,2-DIMETHYLHEXANE			ND			ND			ND				ND		
60 ETHYLCYCLOPENTANE									ND						
61 4-METHYLCYCLOHEXENE			ND			ND	ND	ND						ND	
62 2,5-DIMETHYLHEXANE	ND		ND			ND	ND	ND	ND				ND	ND	ND
63 1-CHLOROPENTANE			ND			ND	ND		ND				ND		
64 1,1,2-TRICHLOROETHANE															
65 2,3,4-TRIMETHYLPENTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND
66 TOLUENE	5.2 (1)	D (1)	10.9 (1)	5.6	D	13.0 (1)	D (1)	7.9 (1)	7.6 (1)	D	D	D	6.9 (1)	7.2 (1)	7.9 (1)
67 1,3-DICHLOROPROPANE															
68 2-METHYLHEPTANE	ND	ND	ND			D (1)	ND	ND	ND				D (1)	ND	ND

	A212	A213	A222	A223	A224_1	A224_2	A232	A233_1	A233_2	A234_1	A234_2	A235	A242	A243	A244
	1448-1548	1611-1711	0820-0920	1017-1047	1203-1303	1400-1500	0900-1000	1050-1150	1240-1340	1450-1550	1650-1750	1855-1955	1000-1100		1410-1510
	JUN 21/88	JUN 21/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 24/88	JUN 24/88	JUN 24/88
	15:52	17:13	09:25	10:57	13:09	15:05	10:05	11:55	13:44	15:55	17:53	19:59	11:06	13:33	15:13
69 4-METHYLHEPTANE															
70 c-1,3-DIMETHYLCYCLOHEXANE			ND				ND	ND	ND				ND	ND	
71 3-METHYLHEPTANE	ND	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND
72 1,2-DIBROMOETHANE															
73 1,1-DIMETHYLCYCLOHEXANE															
74 1-OCTENE															
75 trans12DIMETHYLCYCLOHEXA															
76 trans-4-OCTENE															
77 TETRACHLOROETHENE			D (1)	D (1)			ND		ND			ND	ND	D (1)	
78 c-1,4-DIMETHYLCYCLOHEXAN									ND						
79 OCTANE	ND	ND	ND	ND		ND	ND	ND	ND				ND	ND	ND
80 trans-2-OCTENE									ND						
81 cis12DIMETHYLCYCLOHEXANE															
82 CHLOROBENZENE	ND		ND			ND			ND						
83 ETHYLCYCLOHEXANE			ND												
84 1-CHLOROHEXANE															
85 ETHYLBENZENE	1.0 (1)	ND	D (1)			D	ND	D	ND	ND	ND	ND	D (1)	ND	D
86 M,P-XYLENE	D	D	5.9			8.6	D	D	D	ND	ND	D	D (1)	D	D
87 4-METHYLOCTANE	ND		ND												
88 2-METHYLOCTANE								ND							
89 3-METHYLOCTANE															
90 STYRENE									ND						
91 1,4-DICHLOROBUTANE															
92 o-XYLENE	D	ND	D			D	ND	D	D	ND	ND	ND	D (1)	D	D
93 1,1,2,2-TETRACHLOROETHA															
94 1,2,3-TRICHLOROPROPANE															
95 1-NONENE															
96 NONANE	ND	ND	ND	ND	ND	ND	ND						D		
97 ISOPROPYLBENZENE						ND									
98 2-CHLOROTOLUENE															
99 3-CHLOROTOLUENE															
100 4-CHLOROTOLUENE															
101 PROPYLBENZENE	ND	ND	ND			ND		ND	ND				ND		ND
102 3-ETHYLTOLUENE	D	ND	D			D	ND	ND	ND			ND	D	ND	ND

	A212	A213	A222	A223	A224_1	A224_2	A232	A233_1	A233_2	A234_1	A234_2	A235	A242	A243	A244
	1448-1548	1611-1711	0820-0920	1017-1047	1203-1303	1400-1500	0900-1000	1050-1150	1240-1340	1450-1550	1650-1750	1855-1955	1000-1100		1410-1510
	JUN 21/88	JUN 21/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 22/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 23/88	JUN 24/88	JUN 24/88	JUN 24/88
	15:52	17:13	09:25	10:57	13:09	15:05	10:05	11:55	13:44	15:55	17:53	19:59	11:06	13:33	15:13
103 4-ETHYLTOLUENE								ND	ND						
104 1,3,5-TRIMETHYLBENZENE	ND	ND	ND	ND		D		ND	ND						ND
105 2-ETHYLTOLUENE	ND	ND	ND			ND		ND	ND				ND	ND	ND
106 tert.BUTYLBENZENE												ND			
107 1,2,4-TRIMETHYLBENZENE	D (i)	ND	D (i)			D	ND	D (i)					D (i)	D (i)	
108 tert.BUTYLCYCLOHEXANE															
109 1,3-DICHLOROBENZENE															
110 1-DECENE															
111 1,5-DICHLOROPENTANE															
112 isoBUTYLBENZENE															
113 sec.BUTYLBENZENE															
114 DECANE	ND	ND	D (i)				D (i)	ND	ND				5.2 (i)	D (i)	ND
115 1,2,3-TRIMETHYLBENZENE														ND	
116 1ISOPROPYL4METHYLBENZEN	ND	ND	ND			ND	ND						ND		
117 1,2-DICHLOROBENZENE															
118 INDAN	ND					ND									
119 BUTYLCYCLOHEXANE															
120 1,3-DIETHYLBENZENE															
121 1,4-DIETHYLBENZENE															
122 BUTYLBENZENE															
123 1,2-DIETHYLBENZENE															
124 transDECAHYDRONAPHTHALE															
125 cis-DECAHYDRONAPHTHALENE															
126 UNDECANE	D	ND	D	D	ND	ND	D	D	ND	ND			D (i)	D	D
127 1235-TETRAMETHYLBENZENE															
128 1234-TETRAMETHYLBENZENE															
129 1,3-DIISOPROPYLBENZENE															
130 1234TETRAHYDRONAPHTHALE															
131 1,4-DIISOPROPYLBENZENE															
132 DODECANE		ND	5.1	D	ND	ND	D						3.0		

All concentrations are in ug/m^3 (micrograms per cubic metre)
ND - Not Detected .... 1 ug/m^3
D - Detected .... 1-5 ug/m^3

(i)- Interference

APPENDIX C

Results Summaries for Previous Surveys

1984 Pre-op. I

Table 5
Results Summary - Maximum 1-hr Average Concentration
(ppm, except as noted)

	Monitoring Period #	SO_2	CO	NO_x	Hg ug/m^3	THC	TOC (ug/m^3)	Upwind or Downwind
August	271 A*	-	-	-	-	-	13	D
	271 B	n.d.	0.7	-	-	1.3	8	U
	281 A	n.d.	-	0.02	-	1.8	20,41	U
	283 B	0.02	1.2	0.03	-	2.4	482,328	D
	302 A	0.03	2.0	0.02	-	1.4	64,121	D
	303 B	n.d.	0.5	n.d.	n.d.	1.3	50,86,36	D
	312 A	0.01	0.9	0.01	-	1.3	18,32	U
	312 B	n.d.	1.1	0.02	0.10	1.3	74,93	D
	313 A	n.d.	0.7	0.01	-	1.7	24,27	D
	313 B	0.01	0.5	n.d.	0.14	1.5	23,20,20	D
September	042 B	n.d.	-	-	0.25	1.2	138	D some MAMU ex
	043 A	0.02	-	0.02	-	1.4	4,12	D
	043 B	n.d.	2.2	0.06	0.37	1.3	152,209,247	D some MAMU ex
	044 A	n.d.	0.7	0.01	-	1.4	4,7	D
	052 A	n.d.	0.5	0.02	-	1.2	14,12,13	D
	052 B	n.d.	0.2	0.02	0.38	1.4	11,191,72	D
	053 A	n.d.	1.4	0.07	-	1.3	64,90	D
	053 B	n.d.	n.d.	n.d.	0.25	1.3	63,26	D
	063 B	n.d.	0.6	0.02	-	1.1	83,63	D
	064 A	0.01	1.7	0.02	-	1.2	67	D
	071 B	0.04	0.6	0.05	-	1.3	87	D
	072 A	0.04	0.4	0.02	-	1.4	36,65	D
	Ontario Air Quality Criterion	0.25 (1-hr)	30 (1-hr)	0.20 (1-hr) NO_2	2.0 (24-hr)	-	-	
	Min. Det. Level	0.01	0.1	0.01	0.05	0.1		

* - A refers to MAMU #1
- B refers to MAMU #2

1986 Pre-op. II

TABLE 5

Results Summary - Maximum 1-hr Average Concentration (ppm, except as noted)

December

Monitoring Period #	SO_2	CO	NO_2	Hg (ug/m^3)	THC	TOC** (ug/m^3)	upwind or downwind
A011*	-	0.54	0.06	-	2.1	140	background
B012	0.005	5.91	0.02	-	0.8	118,96	DW
A031	-	1.14	0.07	-	3.6	431,320,132,137	DW
A032	-	0.93	0.05	-	2.7	177	DW
B033	0.010	1.79	0.02	0.011	2.1	148,120	DW
B034	0.005	1.60	0.02	0.010	1.2	433	UW(traffic)
A042	-	0.47	0.04	-	2.4	208,40	DW
B042	0.005	2.75	0.02	0.022	1.4	271,109	DW
A102	0.024	0.47	0.04	-	2.3	158,130	DW
B102	0.022	2.14	0.02	0.005	1.1	266,102,111	DW
A103	0.020	1.86	0.06	-	2.6	304	UW
A112	0.005	0.31	0.04	-	1.4	128,153,24	DW
B112	0.005	2.46	0.02	0.005	1.1	431,113,90	DW
A113	0.005	0.54	0.03	-	1.6	98,20	background
B113	0.005	1.27	0.03	0.005	1.2	88	UW
A122	0.005	0.27	0.02	-	1.8	40	DW
B122	0.005	2.22	0.01	0.005	3.2	391,83	DW

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* A refers to MAMU #1
B refers to MAMU #2

** This list contains all of the TOC results from the gas chromatograph.

- Not monitored.

overnight, weekends at 985 Adelaide St. South	SO_2	CO	NO_2	Hg	THC	TOC
arithmetic mean	0.006	0.57	0.03	-	1.4	-
maximum 1-hr average	0.027	1.94	0.09	-	2.4	-
Ontario Air Quality Criterion	0.25 (1-hr)	30 (1-hr)	0.20 (1-hr)	2.0 (24-hr)	-	-

APPENDIX D

EFW Process Description and Technical Data

The following is not meant to provide a complete description of the process, and data provided is for information only.

1. The EFW plant is designed to incinerate municipal waste at a normal rate of 300 tons per day, and generate steam by cooling down the hot combustion products in waste heat boilers and economizers.

2. High pressure steam is piped to a turbine generator to generate electricity. Some of the steam is extracted from the turbine to satisfy the heating and cooling requirement of the hospital while the remainder expands further in the turbine, and is eventually condensed.

3. The flue gas treating system consists of dry lime injection and baghouses with all the appropriate monitoring and controlling systems.

4. There are three identical "blocks" of incinerator/boiler/flue gas treating equipment connected into three separate stack flues.

5. Each "block"is able to handle 100 tons per day of municipal waste, which is normal loading of one "block".

6. The height of the stack is 92 metres; the diameter of each flue cone at the exit is 762 mm.

7. Each flue has a mass flow of combustion products of approximately 26,671 kg/hour (wet basis). The temperature of the combustion products at the stack is expected to be 125 C.

8. The anticipated volumetric composition of the combustion products is :

CO2	-	8.6% by volume
O2	-	8.6% by volume
N2	-	68.25% by volume
H2O	-	14.5 % by volume
Miscellaneous	-	0.05% by volume

9. A schematic of the EFW plant process is shown on the following page.

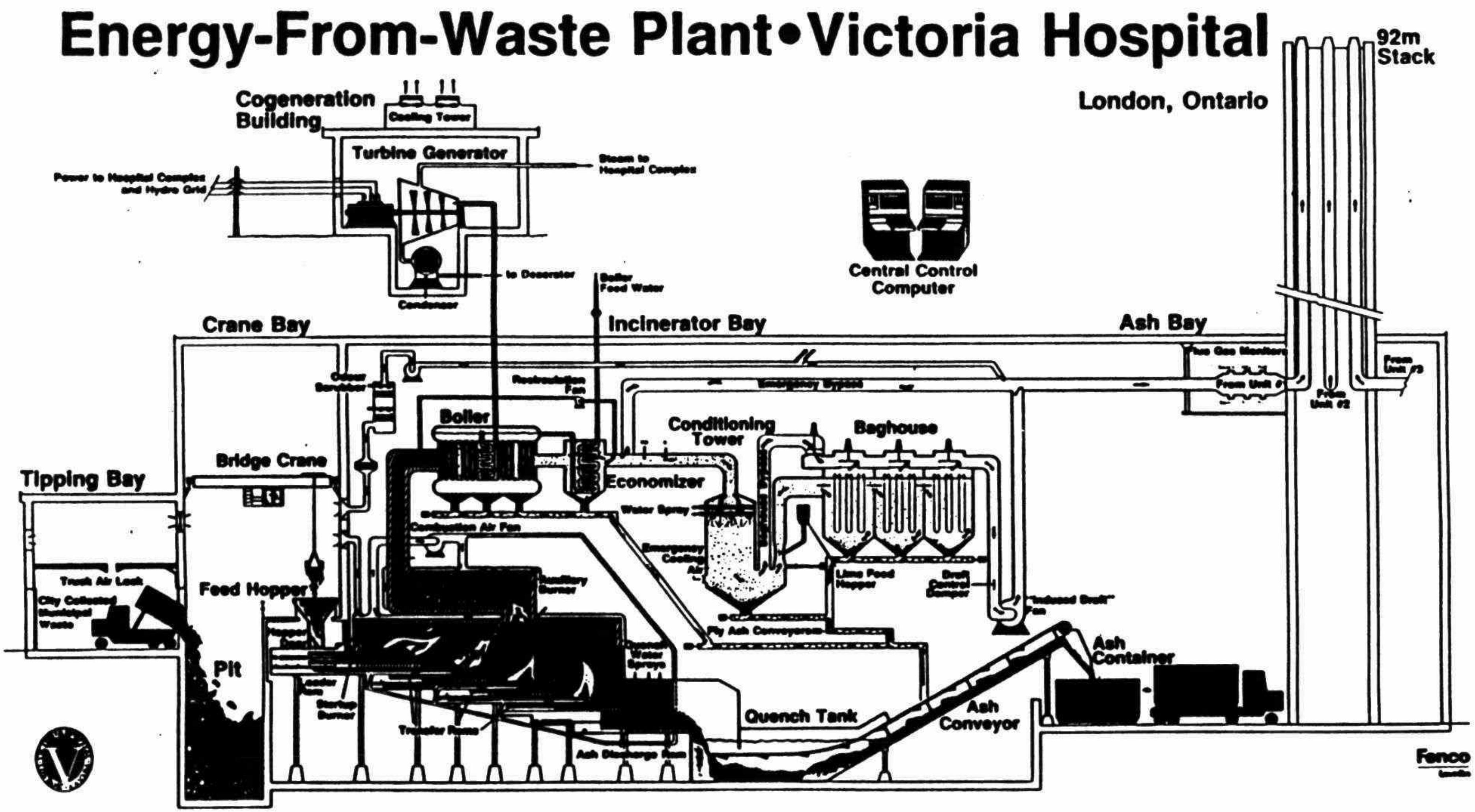

FIGURE Appendix D.1

APPENDIX E

Stack Test
Victoria Hospital
Energy From Waste Plant
Conditions During Survey

Stack testing was scheduled to begin on June 21, 1988. Victoria Hospital staff made the necessary arrangements to have Arthur Gordon Environmental Evaluators Ltd. from St-Hubert, Quebec do the stack test for the Ministry of the Environment. Fenco (with their sub-contractor Procedair) arranged to have a representative from Consumat be on site during the stack testing to setup the incinerators and monitor the operation of the trains.

Preparation before the stack test consisted of doing a routine leak and performance test which includes replacement of faulty bags as required. The gas analyzing equipment was calibrated and checked daily by Victoria Hospital staff. Each train operating parameter was established by the Consumat representative and the plant manager. To ensure that each train would operate normally the plant manager was to oversee the operation from the control room. The Consumat representative would make sure the equipment was operating normally in the field. The weight system on the crane was recalibrated to ensure that an accurate weight of refuse was measured and that each train was burning its designed rate of 100 tons per day.

NOTE: It was discovered a few days after the test began that the weight system on the crane was not accurate. The plant manager conducted a weight test consisting of 30 grapples of refuse where it was determined that an average grapple was 2500 pounds.

The plant manager noted that the trains had been running for over six weeks since the trains were last cleaned. This accounted for the reduced steam production for each train even though the refuse throughput was at 100 tons per day.

The operating parameters were as follows:

DRAFT	...	125 Pa
UPPER CHAMBER TEMP. SET POINT	...	1037 C
BOILER INLET TEMP. SET POINT	...	871 C
BAGHOUSE INLET TEMP. SET POINT	...	150 C
LOAD TIMER BETWEEN 840-960 SECONDS		(CONTROL LOWER CHAMBER 760C)

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